

INVENTORY AND ANALYSIS
APPENDIX

Croton River and Bay Habitat
Haverstraw Bay Habitat

COASTAL FISH & WILDLIFE HABITAT RATING FORM

Name of Area: Croton River and Bay

Designated: November 15, 1987

County: Westchester

Town(s): Cortlandt, Ossining

7½' Quadrangle(s): Haverstraw, NY; Ossining, NY

Score Criterion

- 12 Ecosystem Rarity (ER)
 A major tributary and sheltered bay of the lower Hudson River, but
 rarity reduced by human disturbance; geometric mean: $(9 \times 16)^{\frac{1}{2}} = 12$.
- 0 Species Vulnerability (SV)
 No endangered, threatened or special concern species reside in the
 area.
- 9 Human Use (HU)
 A popular recreational fishing area; one of the recognized "hot
 spots" for striped bass in the lower Hudson River.
- 0 Population Level (PL)
 No unusual concentrations of any fish or wildlife species occur in
 the area.
- 1.2 Replaceability (R)
 Irreplaceable.

SIGNIFICANCE VALUE = $[(ER + SV + HU + PL) \times R]$
 = 25

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITATS PROGRAM
A PART OF THE NEW YORK COASTAL MANAGEMENT PROGRAM

BACKGROUND

New York State's Coastal Management Program (CMP) includes a total of 44 policies which are applicable to development and use proposals within or affecting the State's coastal area. Any activity that is subject to review under Federal or State laws, or under applicable local laws contained in an approved local waterfront revitalization program will be judged for its consistency with these policies.

Once a determination is made that the proposed action is subject to consistency review, a specific policy aimed at the protection of fish and wildlife resources of statewide significance applies. The specific policy statement is as follows: "Significant coastal fish and wildlife habitats will be protected, preserved, and, where practical, restored so as to maintain their viability as habitats." The New York State Department of Environmental Conservation (DEC) evaluates the significance of coastal fish and wildlife habitats, and following a recommendation from the DEC, the Department of State designates and maps specific areas. Although designated habitat areas are delineated on the coastal area map, the applicability of this policy does not depend on the specific location of the habitat, but on the determination that the proposed action is subject to consistency review.

Significant coastal fish and wildlife habitats are evaluated, designated and mapped under the authority of the Coastal Management Program's enabling legislation, the Waterfront Revitalization and Coastal Resources Act (Executive Law of New York, Article 42). These designations are subsequently incorporated in the Coastal Management Program under authority provided by the Federal Coastal Zone Management Act.

This narrative, along with its accompanying map, constitutes a record of the basis for this significant coastal fish and wildlife habitat's designation and provides specific information regarding the fish and wildlife resources that depend on this area. General information is also provided to assist in evaluating impacts of proposed activities on parameters which are essential to the habitat's values. This information is to be used in conjunction with the habitat impairment test found in the impact assessment section to determine whether the proposed activities are consistent with the significant coastal habitats policy.

DESIGNATED HABITAT: CROTON RIVER AND BAY

HABITAT DESCRIPTION:

Croton River and Bay is located on the east side of the Hudson River, in the Villages of Croton-on-Hudson and Ossining, in the Towns of Cortlandt and Ossining, Westchester County (7.5' Quadrangles: Haverstraw, N.Y.; and Ossining, N.Y.).

The fish and wildlife habitat includes an approximate one mile segment of the river (within tidal reach of the Hudson) and an approximate 1,200 acre shallow bay and mudflat area south of Croton Point. The bay contains extensive beds of submergent aquatic vegetation. The Croton River is a relatively large, warmwater stream, with a drainage area of over 375 square miles, and an average annual discharge volume in excess of 500 cubic feet per second. The entire freshwater flow, except for periods of spilling, is diverted out of the Croton River for municipal water supplies. Therefore, the tidal portion of the Croton River is included in the habitat.

In addition to flow diversions, Croton River and Bay have been subject to considerable habitat disturbance, including filling of wetlands for waste disposal, discharges of stormwater runoff, industrial and residential development, and the presence of road and railroad crossings.

FISH AND WILDLIFE VALUES:

Despite significant habitat alterations affecting the area, tidal portions of Croton River and Bay remain important as fish and wildlife habitats in the lower Hudson Valley. Croton River and Bay comprise one of the largest shallow bay areas in the lower river that is sheltered from strong river currents, and to some extent, from prevailing winds. Consequently the area provides favorable habitat conditions for a variety of anadromous and resident warmwater fish species. Use of the area by anadromous species, such as alewife and blueback herring, may be significantly increased if minimum flow requirements were established for the Croton River. Although no unusual concentrations of any fish or wildlife have been documented in Croton River and Bay, it is a productive year-round habitat for resident fish species, such as largemouth bass, brown bullhead, carp, and panfish, and serves as a resting, foraging, and nursery area for anadromous species. As a result of the abundant fisheries resources and accessibility of the area, Croton River and Bay is very popular for recreational fishing; it is one of the recognized "hot spots" for striped bass in the Hudson River.

In addition, these fish populations may be important for osprey (T) during migration. Locally significant numbers of waterfowl may also occur in the area during spring (March - April) and fall (September - November) migrations, but the extent of this use is not well documented.

IMPACT ASSESSMENT:

A habitat impairment test must be met for any activity that is subject to consistency review under federal and State laws, or under applicable local laws contained in an approved local waterfront revitalization program. If the proposed action is subject to consistency review, then the habitat protection policy applies, whether the proposed action is to occur within or outside the designated area.

The specific habitat impairment test that must be met is as follows.

In order to protect and preserve a significant habitat, land and water uses or development shall not be undertaken if such actions would:

destroy the habitat; or,

significantly impair the viability of a habitat.

Habitat destruction is defined as the loss of fish or wildlife use through direct physical alteration, disturbance, or pollution of a designated area or through the indirect effects of these actions on a designated area. Habitat destruction may be indicated by changes in vegetation, substrate, or hydrology, or increases in runoff, erosion, sedimentation, or pollutants.

Significant impairment is defined as reduction in vital resources (e.g., food, shelter, living space) or change in environmental conditions (e.g., temperature, substrate, salinity) beyond the tolerance range of an organism. Indicators of a significantly impaired habitat focus on ecological alterations and may include but are not limited to reduced carrying capacity, changes in community structure (food chain relationships, species diversity), reduced productivity and/or increased incidence of disease and mortality.

The tolerance range of an organism is not defined as the physiological range of conditions beyond which a species will not survive at all, but as the ecological range of conditions that supports the species population or has the potential to support a restored population, where practical. Either the loss of individuals through an increase in emigration or an increase in death rate indicates that the tolerance range of an organism has been exceeded. An abrupt increase in death rate may occur as an environmental factor falls beyond a tolerance limit (a range has both upper and lower limits). Many environmental factors, however, do not have a sharply defined tolerance limit, but produce increasing emigration or death rates with increasing departure from conditions that are optimal for the species.

The range of parameters which should be considered in applying the habitat impairment test include but are not limited to the following:

1. physical parameters such as living space, circulation, flushing rates, tidal amplitude, turbidity, water temperature, depth (including loss of littoral zone), morphology, substrate type, vegetation, structure, erosion and sedimentation rates;

2. biological parameters such as community structure, food chain relationships, species diversity, predator/prey relationships, population size, mortality rates, reproductive rates, meristic features, behavioral patterns and migratory patterns; and,
3. chemical parameters such as dissolved oxygen, carbon dioxide, acidity, dissolved solids, nutrients, organics, salinity, and pollutants (heavy metals, toxics and hazardous materials).

Although not comprehensive, examples of generic activities and impacts which could destroy or significantly impair the habitat are listed below to assist in applying the habitat impairment test to a proposed activity.

Any activity that would substantially degrade water quality, increase turbidity or sedimentation, reduce flows, or increase water temperatures in Croton River and Bay would result in significant impairment of the habitat. Any physical alteration of the habitat, through dredging, filling, or bulkheading, would result in a direct loss of valuable habitat area.

Habitat disturbances would be most detrimental during fish spawning and incubation periods, which generally extend from April through July for most warmwater species. Discharges of sewage or stormwater runoff containing sediments or chemical pollutants may result in significant adverse impacts on fish populations.

Similarly, spills of oil or other hazardous substances, and leachate of contaminated groundwater, constitute a potential threat to fish and wildlife in the bay. Of particular concern in this major tributary system are the potential effects of upstream disturbances, including water withdrawals, impoundments, stream bed disturbances, and effluent discharges. Establishment of minimum flow requirements for the Croton River up to the first impassable barrier to fish has had a significant beneficial effect on the area; however, under draught conditions, releases from the New Croton Reservoir can be reduced to zero.

Existing areas of natural vegetation bordering Croton River and Bay should be maintained to provide bank cover, soil stabilization, perching sites, and buffer areas. However, development of public access to the bay area may be desirable to ensure that adequate opportunities for compatible human uses of the fish and wildlife resources are available.

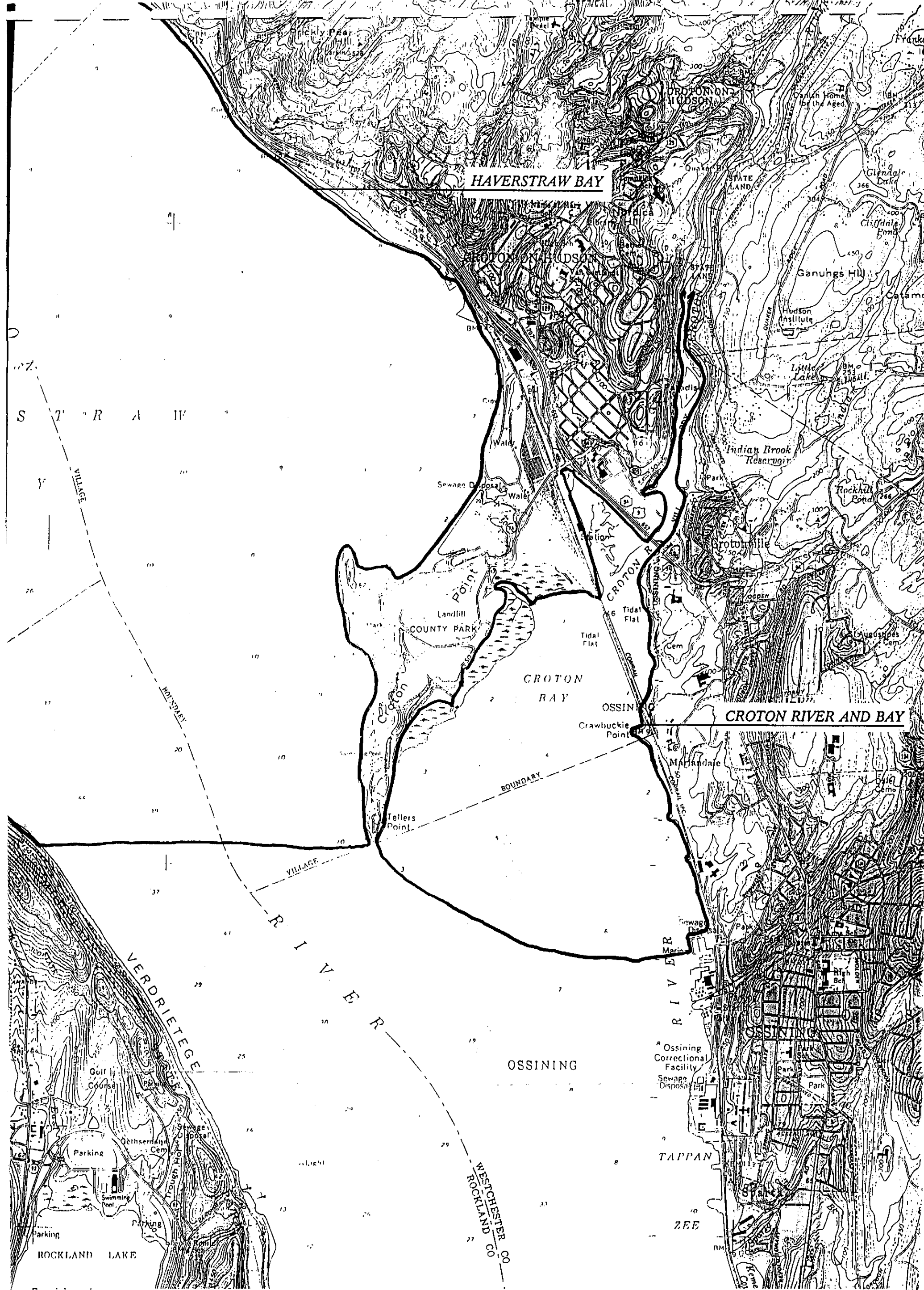
KNOWLEDGEABLE CONTACTS:

Tom Hart
N.Y.S. Department of State
Division of Coastal Resources &
Waterfront Revitalization
162 Washington Avenue
Albany, NY 12231
Phone: (518) 474-6000

Wayne Elliot, Fisheries Manager
or Glenn Cole, Wildlife Manager
or Jack Isaacs, Environmental Protection Biologist
NYSDEC - Region 3
21 So. Putt Corners Road
New Paltz, NY 12561
Phone: (914)255-5453

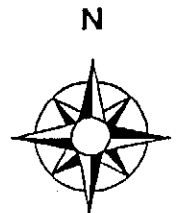
Thomas D. Goodwin
Environmental Planner
Division of Environmental Planning
County Environmental Management Council
427 Michaelian Office Building
White Plains, NY 10601
Phone: (914) 285-4422

NYSDEC Information Services
700 Troy-Schenectady Road
Latham, NY 12110
Phone: (518)783-3932



SIGNIFICANT COASTAL FISH AND WILDLIFE HABITATS

Croton River and Bay / Haverstraw Bay (In part)



COASTAL FISH & WILDLIFE HABITAT RATING FORM

Name of Area: Haverstraw Bay

Designated: November 15, 1987

County(ies): Rockland; Westchester

Town(s): Clarkstown, Haverstraw, Stony Point; Cortlandt

7½' Quadrangle(s): Haverstraw, NY; NOAA Chart No. 12343

Score Criterion

40 Ecosystem Rarity (ER)

The most extensive area of shallow estuarine habitat in the lower Hudson River (and in New York State), but rarity reduced by human disturbances; geometric mean: $(25 \times 64)^{\frac{1}{2}} = 40$.

36 Species Vulnerability (SV)

Shortnose sturgeon (E) regularly occur in the area.

38 Human Use (HU)

The area contributes to recreational and commercial fisheries throughout the northeastern U.S.; additive division: $25 + 25/2 = 38$

25 Population Level (PL)

A major spawning, nursery, and wintering area for various estuarine fish species; population levels unusual in the northeastern U.S.

1.2 Replaceability (R)
Irreplaceable.

$$\begin{aligned} \text{SIGNIFICANCE VALUE} &= [(ER + SV + HU + PL) \times R] \\ &= 166 \end{aligned}$$

SIGNIFICANT COASTAL FISH AND WILDLIFE HABITATS PROGRAM
A PART OF THE NEW YORK COASTAL MANAGEMENT PROGRAM

BACKGROUND

New York State's Coastal Management Program (CMP) includes a total of 44 policies which are applicable to development and use proposals within or affecting the State's coastal area. Any activity that is subject to review under Federal or State laws, or under applicable local laws contained in an approved local waterfront revitalization program will be judged for its consistency with these policies.

Once a determination is made that the proposed action is subject to consistency review, a specific policy aimed at the protection of fish and wildlife resources of statewide significance applies. The specific policy statement is as follows: "Significant coastal fish and wildlife habitats will be protected, preserved, and, where practical, restored so as to maintain their viability as habitats." The New York State Department of Environmental Conservation (DEC) evaluates the significance of coastal fish and wildlife habitats, and following a recommendation from the DEC, the Department of State designates and maps specific areas. Although designated habitat areas are delineated on the coastal area map, the applicability of this policy does not depend on the specific location of the habitat, but on the determination that the proposed action is subject to consistency review.

Significant coastal fish and wildlife habitats are evaluated, designated and mapped under the authority of the Coastal Management Program's enabling legislation, the Waterfront Revitalization and Coastal Resources Act (Executive Law of New York, Article 42). These designations are subsequently incorporated in the Coastal Management Program under authority provided by the Federal Coastal Zone Management Act.

This narrative, along with its accompanying map, constitutes a record of the basis for this significant coastal fish and wildlife habitat's designation and provides specific information regarding the fish and wildlife resources that depend on this area. General information is also provided to assist in evaluating impacts of proposed activities on parameters which are essential to the habitat's values. This information is to be used in conjunction with the habitat impairment test found in the impact assessment section to determine whether the proposed activities are consistent with the significant coastal habitats policy.

DESIGNATED HABITAT: HAVERSTRAW BAY

HABITAT DESCRIPTION:

Haverstraw Bay extends approximately six miles on the Hudson River, from Stony Point to Croton Point, in the Towns of Stony Point, Haverstraw, and Clarkstown, in Rockland County, and the Town of Cortlandt, in Westchester County (7.5' Quadrangle: Haverstraw, N.Y.; NOAA Chart No. 12343).

The fish and wildlife habitat encompasses the entire river over this approximate six mile reach, which is the widest section of the Hudson estuary. Haverstraw Bay has extensive shallow areas (less than 15 feet deep at mean low water) which deepen to a navigation channel (which is dredged to maintain a depth of about 35 feet) in the western half of the area. During much of the year, this area is the place where freshwater from the upper river mixes with salt water from the Atlantic, producing a predominantly brackish water habitats, with salinities varying from 0-10 ppt. The land area surrounding Haverstraw Bay supports a variety of land uses, including industrial, commercial, residential, and recreational developments, although much undeveloped forestland also remains.

Habitat disturbances, such as dredging, shoreline filling and bulkheading, waste disposal, and pollution from upland and in-river sources, have all been significant at some time during the recent history of this area.

FISH AND WILDLIFE VALUES:

Despite various habitat disturbances, Haverstraw Bay possesses a combination of physical and biological characteristics that make it one of the most important fish and wildlife habitats in the Hudson River estuary. The regular occurrence of brackish water over extensive areas of shallow bottom creates highly favorable (if not essential) conditions for biological productivity within the estuary, including submergent vegetation, phytoplankton and zooplankton, aquatic invertebrates, and many fish species.

Although the location of the salt front varies annually (and seasonally), Haverstraw Bay regularly comprises a substantial part of the nursery area for striped bass, American shad, white perch, tomcod, and Atlantic sturgeon that are produced in the Hudson. Other anadromous species, such as blueback herring and alewife, spawn in upstream freshwater areas, but move south and concentrate in this area before leaving the river in the fall.

Haverstraw Bay is also a major nursery and feeding area for certain marine species, most notably bay anchovy, Atlantic menhaden, and blue claw crab. Depending on location of the salt front, a majority of the spawning and wintering populations of Atlantic sturgeon in the Hudson may reside in Haverstraw Bay. Shortnose sturgeon (E) usually winter in this area as well. Significant numbers of waterfowl may occur in Haverstraw Bay during spring (March-April) and fall (September-November) migrations, but the extent of this use is not well documented.

Haverstraw Bay is a critical habitat for most estuarine-dependent fisheries originating from the Hudson River. This area contributes directly to the production of in-river and ocean populations of food, game, and forage fish species. Consequently, commercial and recreational fisheries throughout the North Atlantic depend on, or benefit from, these biological inputs from the Hudson River estuary.

IMPACT ASSESSMENT:

A habitat impairment test must be met for any activity that is subject to consistency review under federal and State laws, or under applicable local laws contained in an approved local waterfront revitalization program. If the proposed action is subject to consistency review, then the habitat protection policy applies, whether the proposed action is to occur within or outside the designated area.

The specific habitat impairment test that must be met is as follows.

In order to protect and preserve a significant habitat, land and water uses or development shall not be undertaken if such actions would:

destroy the habitat; or,

significantly impair the viability of a habitat.

Habitat destruction is defined as the loss of fish or wildlife use through direct physical alteration, disturbance, or pollution of a designated area or through the indirect effects of these actions on a designated area. Habitat destruction may be indicated by changes in vegetation, substrate, or hydrology, or increases in runoff, erosion, sedimentation, or pollutants.

Significant impairment is defined as reduction in vital resources (e.g., food, shelter, living space) or change in environmental conditions (e.g., temperature, substrate, salinity) beyond the tolerance range of an organism. Indicators of a significantly impaired habitat focus on ecological alterations and may include but are not limited to reduced carrying capacity, changes in community structure (food chain relationships, species diversity), reduced productivity and/or increased incidence of disease and mortality.

The tolerance range of an organism is not defined as the physiological range of conditions beyond which a species will not survive at all, but as the ecological range of conditions that supports the species population or has the potential to support a restored population, where practical. Either the loss of individuals through an increase in emigration or an increase in death rate indicates that the tolerance range of an organism has been exceeded. An abrupt increase in death rate may occur as an environmental factor falls beyond a tolerance limit (a range has both upper and lower limits). Many environmental factors, however, do not have a sharply defined tolerance limit, but produce increasing emigration or death rates with increasing departure from conditions that are optimal for the species.

The range of parameters which should be considered in applying the habitat impairment test include but are not limited to the following:

1. physical parameters such as living space, circulation, flushing rates, tidal amplitude, turbidity, water temperature, depth (including loss of littoral zone), morphology, substrate type, vegetation, structure, erosion and sedimentation rates;
2. biological parameters such as community structure, food chain relationships, species diversity, predator/prey relationships, population size, mortality rates, reproductive rates, meristic features, behavioral patterns and migratory patterns; and,
3. chemical parameters such as dissolved oxygen, carbon dioxide, acidity, dissolved solids, nutrients, organics, salinity, and pollutants (heavy metals, toxics and hazardous materials).

Although not comprehensive, examples of generic activities and impacts which could destroy or significantly impair the habitat are listed below to assist in applying the habitat impairment test to a proposed activity.

Any activity that would substantially degrade water quality, increase turbidity or sedimentation, or alter water salinities or temperatures in Haverstraw Bay would result in significant impairment of the habitat. Any physical modification of the habitat or adjacent wetlands, through dredging, filling, or bulkheading, would result in a direct loss of valuable habitat area.

Habitat disturbances would be most detrimental during fish spawning and early developmental periods, which generally extend from April through August for most anadromous species using the area. Discharges of sewage or stormwater runoff containing sediments or chemical pollutants may result in significant adverse impacts on fish populations. Similarly, spills of oil or other hazardous substances, and leachate of contaminated groundwater, constitute a potential threat to fish and wildlife in the bay. Of particular concern in this major estuarine system are the potential effects of hydrologic disturbances, and effluent discharges. Existing areas of natural vegetation bordering Haverstraw Bay should be maintained to provide soil stabilization and buffer areas.

KNOWLEDGEABLE CONTACTS:

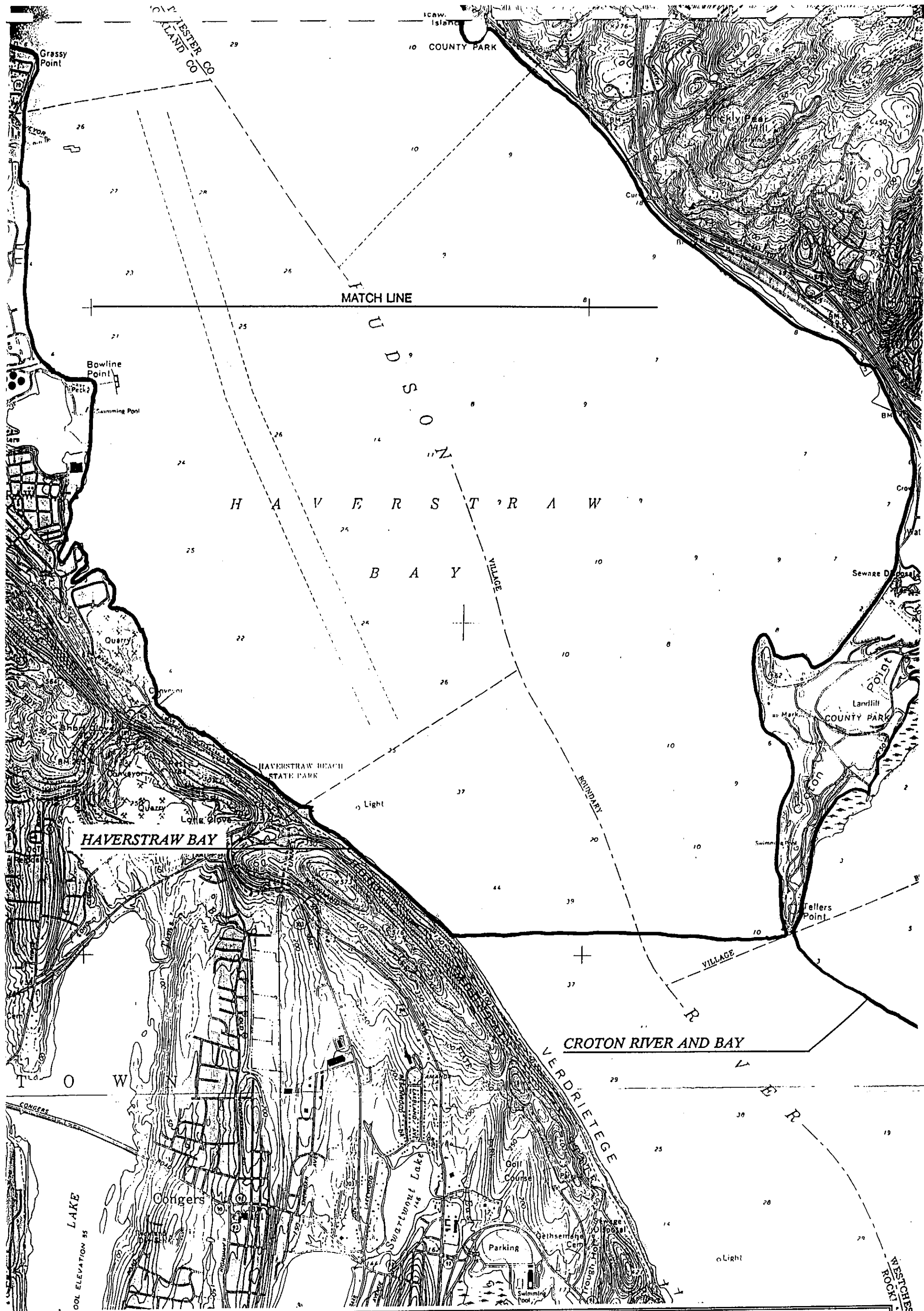
Tom Hart
N.Y.S. Department of State
Division of Coastal Resources &
Waterfront Revitalization
162 Washington Avenue
Albany, NY 12231
Phone: (518) 474-6000

Wayne Elliot, Fisheries Manager
or Jack Isaacs, Environmental Protection Biologist
NYSDEC - Region 3
21 South Putt Corners Road
New Paltz, NY 12561
Phone: (914) 255-5453

Doug Carlson, Hudson River Fisheries Unit
NYSDEC - Region 4
Route 10, Jefferson Road
Stamford, NY 12167
Phone: (607) 652-7364

William L. Dovel
Route 1, Box 800
Venice, FL 33595
Phone: (813) 493-4354

NYSDEC Information Services
700 Troy-Schenectady Road
Latham, NY 12110
Phone: (518) 783-3932



SIGNIFICANT COASTAL FISH AND WILDLIFE HABITATS

Haverstraw Bay (In part) / Croton River and Bay (In part)

New York State Department of State Division of Coastal Resources and Waterfront Revitalization



Prepared by T. Hart and G. Capobianco September 1990